



General

Guideline Title

Chronic obstructive pulmonary disease (COPD).

Bibliographic Source(s)

Medical Services Commission. Chronic obstructive pulmonary disease (COPD). Victoria (BC): British Columbia Medical Services Commission; 2011 Jan 1. 17 p. [25 references]

Guideline Status

This is the current release of the guideline.

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- [March 22, 2016 – Opioid pain medicines](#) : The U.S. Food and Drug Administration (FDA) is warning about several safety issues with the entire class of opioid pain medicines. These safety risks are potentially harmful interactions with numerous other medications, problems with the adrenal glands, and decreased sex hormone levels. They are requiring changes to the labels of all opioid drugs to warn about these risks.

Recommendations

Major Recommendations

Diagnosis

Chronic obstructive pulmonary disease (COPD) is under-diagnosed. A definitive diagnosis is made with spirometry.

a. Signs and Symptoms Indicating the Need for Spirometry Testing

Use clinical judgment to select patients for spirometry testing. Consider spirometry testing for new COPD patients at high risk:*

- Smokers or ex-smokers 40 years of age or older

- Persistent cough or sputum production
- Frequent respiratory infections
- Unexplained shortness of breath

Chest X-ray is usually done to exclude co-morbidities. A chest X-ray may suggest COPD, but the definitive diagnosis of COPD requires spirometry.

*Some patients with COPD may not have used tobacco. Other risk factors include: occupational exposures, alpha-1 antitrypsin deficiency, early childhood lung infections, and exposure to air pollutants, particularly where wood is burned indoors.

b. Diagnosis by Spirometry

Note: In office spirometry requires approval by the College of Physicians and Surgeons Diagnostic Accreditation Program

A post bronchodilator forced expiratory volume in the first second to forced vital capacity ratio (FEV_1/FVC) of less than 0.7 defines airflow obstruction that is not fully reversible and establishes a diagnosis of COPD.

Note: COPD and asthma commonly coexist.

- Compared to the baseline FEV_1 , asthmatic patients will have a 12% or greater improvement in FEV_1 15 minutes after the use of an inhaled short-acting β_2 agonist. In adults, the FEV_1 also increases by more than 200 ml.
- Long term improvements in spirometry may indicate asthma.
- In some situations, a corticosteroid trial may be appropriate to differentiate COPD from asthma.

c. COPD Classification by Symptoms and Spirometry

Table: COPD Classification by Symptoms and Spirometry

COPD Stage*	Symptoms	Spirometry
At Risk (not yet COPD)	Asymptomatic smoker or ex-smoker or chronic cough/sputum	FEV_1 $\geq 80\%$ predicted FEV_1/FVC ≥ 0.7
Mild	Shortness of breath from COPD with strenuous exercise or while hurrying on the level or walking up a slight hill	FEV_1 60%- 79% predicted FEV_1/FVC < 0.7
Moderate	Shortness of breath from COPD causing the patient to walk slower than most people of the same age on the level or stop after walking about 100 m on the level	FEV_1 40%- 59% predicted FEV_1/FVC < 0.7
Severe	Shortness of breath from COPD resulting in the patient too breathless to leave the house, or breathless after dressing or undressing or the presence of chronic respiratory failure or clinical signs of right heart failure	FEV_1 30%- 39% predicted FEV_1/FVC < 0.7
Very Severe		FEV_1 $< 30\%$ predicted FEV_1/FVC < 0.7

COPD Stage*	Symptoms	Spirometry
Adapted from the Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease - 2007 update.		

*Symptoms may not correlate directly with clinical signs. As a result, patients may belong in more than 1 COPD stage (namely, clinical versus spirometric stages).

If clinical uncertainty of the diagnosis remains, specialist consultation is recommended.

Management of COPD

a. Care Objectives

Physicians are encouraged to:

- Identify new patients with COPD by spirometry
- Monitor key clinical indicators of COPD using a flow sheet (refer to Appendix A, "Patient Care Flow Sheet," in the original guideline document) or an equivalent care plan
- Use recall systems to ensure that patients are seen at appropriate intervals; at least twice yearly
- Review patient records to ensure that goals of care are met (refer to Appendix A, "Patient Care Flow Sheet," in the original guideline document)
- Consider co-morbidities

The therapeutic goals of management of COPD are to:

- Prevent disease progression (smoking cessation)
- Alleviate breathlessness and other respiratory symptoms
- Improve exercise tolerance and daily activity
- Reduce frequency and severity of exacerbations
- Treat exacerbations and complications of the disease
- Improve health status
- Reduce mortality

A management strategy including pharmacotherapy and non-pharmacotherapeutic approaches can improve symptoms, activity levels and quality of life even in patients with severe COPD. See Figure 1 in the original guideline document of how severity can help guide the management of the disease.

b. Lifestyle Management

Smoking Cessation

- Smoking is the most important cause of and contributing factor for COPD progression.
- Smoking cessation is the most important factor in slowing the progression of COPD.
- Smoking cessation is effective in preventing disease progression even in long-term smokers.
- Effective strategies exist to aid in smoking cessation. These include:
 - Nicotine replacement therapy which may need to be used long term
 - Other pharmacotherapy (note that these have significant side effects)
- Even minimal intervention may be helpful and should be offered to every smoker. Counselling may be appropriate.
- Consider referral of the smoker with COPD to the British Columbia (BC) Smokers Helpline (refer to "A Guide for Patients" in the original guideline document).
- Smoking cessation of the patient and household contacts should be reinforced at every contact.
- For additional information, refer to the guideline Cardiovascular Disease – Primary Prevention, Appendix A – Part 1: Smoking Cessation available at www.BCGuidelines.ca .

c. Education and Self-Management

Education of the patients and family can improve coping skills and quality of life and reduce the likelihood of hospitalization from COPD.

The physician is encouraged to:

- Reinforce smoking cessation
- Encourage exercise
- Refer the smoker with COPD to the BC Smokers Helpline (refer to "A Guide for Patients" in the original guideline document)
- Help the patient identify resources and a support team (e.g., physician, pharmacist, nurse, dietitian as appropriate)
- Refer the patient to a pulmonary rehabilitation program where available and to community respiratory services

- Encourage patients to stay indoors when air quality is poor, as air quality may have a significant effect on COPD

Remaining active despite symptoms of shortness of breath must remain a priority for all patients with COPD. Clinically stable COPD patients whose activities remain symptom-limited despite optimal therapy should be referred to an exercise training program. Formal pulmonary rehabilitation programs that include patient education and exercise can reduce symptoms, decrease exacerbations, and improve exercise endurance and quality of life.

d. Pharmacologic Management

Refer to Appendix B, "Prescription Medication Table for Chronic Obstructive Pulmonary Disease (COPD)," in original guideline document.

Bronchodilators are the mainstay of COPD pharmacotherapy. Pharmacological treatment of COPD has not been shown to reverse, slow, or prevent progressive decline in lung function, but can improve symptoms, reduce exacerbations and hospitalizations, and improve quality of life. Bronchodilators reduce air trapping, dyspnea, and improve quality of life even if improvement is not seen on spirometry.

- Patients with mild COPD should be prescribed a short-acting inhaled beta₂ agonist or ipratropium to be used as needed.
- If symptoms persist, then consider regular use of ipratropium or a long-acting bronchodilator (tiotropium or a long-acting beta₂ agonist [LABA]).
- If the patient continues to be symptomatic despite the addition of tiotropium or LABA, the other may be added.
- Concurrent use of tiotropium and ipratropium is not recommended.
- Regular use of inhaled corticosteroids could be added to combination tiotropium and LABA therapy for patients with moderate to severe COPD with a history of exacerbations (one or more per year, on average, for two consecutive years) to reduce exacerbations, or if asthma coexists. Long term oral corticosteroid therapy is not recommended.
- If indications for both a LABA and an inhaled corticosteroid exist, then consider a combination product containing both medications.
- Theophylline may be useful in select patients with persistent symptoms despite optimal inhaled therapy.
- Evaluate the patient's inhaler technique regularly. Consider prescribing a spacer for metered dose inhalers. Dry powder inhalers are not used with a spacer.

Controversies in care

- Cohort and case-control studies have concluded that ipratropium has a small but consistent negative effect on cardiovascular safety. This has not been validated by a large randomized controlled trial (RCT).
- However, concerns of increased mortality and cardiovascular events with the use of tiotropium are not supported by the results of a large RCT and a pooled analysis.
- Large RCTs have not demonstrated the benefit of tiotropium combined with LABA compared to either agent alone.
- Retrospective analyses have shown an increased risk of pneumonia in COPD patients prescribed inhaled corticosteroids. This effect has been, in general, with higher doses of fluticasone but was not seen in a recent large individual patient systematic review of budesonide. The significance of the results is uncertain given the lack of standardization of the definition of pneumonia in these studies.

e. Ongoing Care

Immunization against influenza and pneumococcal infections:

- Annual influenza vaccination
- Pneumococcal vaccination at least once and repeated in 5-10 years

Oxygen therapy

- The goal of oxygen therapy is to maintain the partial pressure of oxygen in arterial blood (PaO₂) ≥60 mmHg or the percent oxygen saturation (SpO₂) ≥90% at rest (refer to local health authority for local criteria), on exertion and during sleep.
- Oxygen therapy may be a useful addition to exercise therapy.
- Refer to Appendix C in original guideline document for an example of medical indications for home oxygen.

f. Acute Exacerbations (AECOPD) Require More Intensive Management

Acute exacerbations are characterized by sustained (48 hours or more) worsening of shortness of breath and coughing, with or without sputum. The most common cause is a viral or bacterial infection. Develop an exacerbation plan with the patient (see the example in Appendix D, "COPD Flare up Action Plan," in the original guideline document). Severe AECOPD complicated by acute respiratory failure is a medical emergency.

Therapies should include:

- Therapy with short-acting beta₂ agonists and anticholinergic bronchodilators
- Oral corticosteroids (e.g., prednisone 25-50 mg/day) for less than two weeks in most moderate to severe COPD patients. A dose of

30–40 mg of prednisone equivalent per day has been used in practice.

- Antibiotic use is based on risk factors (see Appendix E, "Antibiotic Treatment Recommendations for Acute Exacerbations of COPD [AECOPD]" in the original guideline document).

g. Manage Co-Morbidities

COPD patients commonly present with several co-morbidities which reduce quality of life and significantly increase the cost of care to patients and the health care system. Once detected, these co-morbidities should be treated aggressively.

In patients with mild to moderate COPD, cardiovascular diseases are the leading causes of hospitalizations and the second leading cause of mortality after lung cancer. In severe and very severe COPD, respiratory failure and pneumonia are the leading causes of morbidity and mortality. However, even in these patients, cardiovascular diseases remain a major concern.

Table: Common Co-Morbidities with COPD

Cardiovascular disease <ul style="list-style-type: none">• Cardiac arrhythmias• Ischemic heart disease• Heart failure	Musculoskeletal disorders <ul style="list-style-type: none">• Osteoporosis• Peripheral muscle weakness
Mental health disorders <ul style="list-style-type: none">• Depression• Anxiety• Sleep disorders	Systemic complications <ul style="list-style-type: none">• Weight loss• Cachexia• Chronic anemia or polycythemia
Cancer	Diabetes mellitus

h. Indications for Specialist Referral

- The diagnosis is uncertain.
- A young patient with COPD and limited smoking history or those with severe symptoms and disability which is disproportionate to their lung function decline.
- There are signs and symptoms of hypoxemic or hypercarbic respiratory failure.
- There are severe or recurrent exacerbations and treatment failure.
- The patient has severe COPD and disability requiring more intensive interventions including surgical therapies.
- More intensive co-morbidity assessment and management is required.
- Difficulty in assessing home oxygen or sleep disorders.

i. End of Life Care

Prior to initiating end of life care:

- Address the precipitating factors
- Explore all active therapeutic options
- Consider co-morbidity

End-of-life care:

- Manage all symptoms (including those of co-morbid conditions) and address function and quality of life issues.
- Review need for home oxygen and treatment for severe dyspnea including opioids, neuroleptics and benzodiazepines.
- Maintain patient autonomy. Most patients are willing to discuss advance care planning and it is best done in a non-acute setting.
- It is important to ensure that advanced care planning, encompassing financial and health care decisions (e.g., Representation Agreement) has been carried out.
- Decisions need to be made and documented as to whether and when to pursue hospital admission and what are the options for care and the level of intervention.
- Ensure that bilevel positive airway pressure device (BiPAP) is not overlooked.
- Consultation with a specialist in respiratory, palliative care or geriatric medicine may be helpful.

Advance care planning allows patients to plan for end of life care. Making decisions about the intensity of end of life care is a highly individualized process and requires continuous review as COPD progresses. Refer to the Resources section in the original guideline document for resources on end of life care.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Chronic obstructive pulmonary disease (COPD):

- Chronic bronchitis
- Emphysema

Guideline Category

Counseling

Diagnosis

Evaluation

Management

Treatment

Clinical Specialty

Allergy and Immunology

Critical Care

Emergency Medicine

Family Practice

Internal Medicine

Nursing

Pulmonary Medicine

Intended Users

Advanced Practice Nurses

Health Care Providers

Hospitals

Nurses

Pharmacists

Physician Assistants

Physicians

Respiratory Care Practitioners

Guideline Objective(s)

To provide strategies for the improved diagnosis and management of adults with chronic bronchitis and emphysema (chronic obstructive pulmonary disease [COPD])

Target Population

Adults with chronic bronchitis or emphysema (chronic obstructive pulmonary disease [COPD])

Interventions and Practices Considered

Diagnosis/Assessment

1. Assessment of signs and symptoms
2. Chest x-ray to exclude co-morbidities
3. Spirometry to assess forced expiratory volume in the first second (FEV₁) and forced vital capacity (FVC)
4. Differential diagnosis from asthma
5. Classification of severity of chronic obstructive pulmonary disease (COPD)
6. Specialist consultation for uncertain diagnosis

Management/Treatment

1. Development of a care plan
2. Monitoring at least twice yearly
3. Encouraging smoking cessation
4. Providing education for self-management
5. Pulmonary rehabilitation
6. Stepwise therapy approach
7. Bronchodilators (short-acting beta₂ agonists, long-acting beta₂ agonists, anticholinergics, theophylline)
8. Combination therapy (concurrent use of tiotropium and ipratropium is not recommended)
9. Inhaled corticosteroids
10. Immunizing for influenza and pneumococcal infection
11. Oxygen therapy
12. Antibiotics as indicated
13. Surgery as indicated
14. Management of co-morbidities
15. Specialist referral as indicated
16. End of life counselling and care, including advanced care planning

Major Outcomes Considered

- Diagnostic accuracy of spirometry
- Rate of diagnosis of co-morbidities
- Rate of symptom reduction with pulmonary rehabilitation
- Rate of symptom reduction with pharmacotherapy
- Side effects of pharmacotherapy
- Incidence of influenza or pneumonia infections in patients with chronic obstructive pulmonary disease (COPD)
- Rate of symptom reduction with oxygen therapy
- Effectiveness of monitoring and evaluation protocols for chronic COPD
- Frequency and severity of exacerbations
- Morbidity

- Mortality
- Rate and duration of hospitalization
- Quality of life

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Evidence was obtained through a systematic review of peer-reviewed literature (up to November 2010) using the databases MEDLINE, PubMed, EBSCO, Ovid, and the Cochrane Collaboration's Database for Systematic Reviews. Search terms include chronic obstructive pulmonary disease, chronic bronchitis, emphysema but not bronchitis unspecified. Clinical practice guidelines from other jurisdictions for chronic obstructive pulmonary disease were also reviewed (up to November 2010).

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Not stated

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

This guideline is an evidence-based clinical guideline for general practitioners with consensus statements when evidence is not available. It is based on scientific evidence current as of the Effective Date.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The guideline was approved by the British Columbia Medical Association and adopted by the Medical Services Commission.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

This guideline is an evidence-based clinical guideline for general practitioners with consensus statements when evidence is not available. The type of supporting evidence is not specifically stated for each recommendation.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate diagnosis and management of adults with chronic bronchitis and emphysema (chronic obstructive pulmonary disease [COPD])

Potential Harms

Side effects of smoking cessation pharmacotherapy

Contraindications

Contraindications

Fluoroquinolone resistance increases with frequent prescriptions. Avoid these medications if prescribed in the previous 3 months (for any indication), and consider an antibiotic from a different class.

Qualifying Statements

Qualifying Statements

The Clinical Practice Guidelines (the "Guidelines") have been developed by the Guidelines and Protocols Advisory Committee on behalf of the Medical Services Commission. The Guidelines are intended to give an understanding of a clinical problem, and outline one or more preferred approaches to the investigation and management of the problem. The Guidelines are not intended as a substitute for the advice or professional judgment of a health care professional, nor are they intended to be the only approach to the management of clinical problems.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Chart Documentation/Checklists/Forms

Mobile Device Resources

Patient Resources

Quick Reference Guides/Physician Guides

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

End of Life Care

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Medical Services Commission. Chronic obstructive pulmonary disease (COPD). Victoria (BC): British Columbia Medical Services Commission; 2011 Jan 1. 17 p. [25 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2011 Jan 1

Guideline Developer(s)

Medical Services Commission, British Columbia - State/Local Government Agency [Non-U.S.]

Source(s) of Funding

Medical Services Commission, British Columbia

Guideline Committee

Guidelines and Protocols Advisory Committee

Composition of Group That Authored the Guideline

Not stated

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [British Columbia Ministry of Health Web site](#) .

The guideline is also available for mobile devices from the [British Columbia Ministry of Health Web site](#) .

Availability of Companion Documents

The following is available:

- Chronic obstructive pulmonary disease (COPD). Summary of guideline. Victoria (BC): British Columbia Medical Services Commission; 2011 Jan 1. 2 p. Electronic copies: Available in Portable Document Format (PDF) from the [British Columbia Ministry of Health Web site](#) .

In addition, a patient care flow sheet, COPD flare-up action plan, and information about medications and antibiotics used in COPD treatment are available in the appendices to the [original guideline document](#) .

Patient Resources

A patient guide is available in the [original guideline document](#) .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI Institute on January 31, 2013. The information was verified by the guideline developer on March 20, 2013. This summary was updated by ECRI Institute on October 25, 2013 following the U.S. Food and Drug Administration advisory on Fluoroquinolone Antibacterial Drugs. This summary was updated by ECRI Institute on June 2, 2016 following the U.S. Food and Drug Administration advisory on Opioid pain medicines.

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